

The relationship of "vital action" to "physical phenomena" is carefully discussed, for the expressions "physical" and "vital" point a contrast constantly present to the physiologist's mind, and lead to much confusion. He is apt to regard as physical whatever he can test and measure in his laboratory, but cannot, however, make a model of a living cell or isolate it from the "vital" process which surrounds its existence in the living body. The technicalities of the nervous system are relieved by applied side-issues, often in the form of conversations, which enliven what are apt to be mere dry details.

The chapters on the special senses which close the book are fraught with information useful to physiologists, to musicians, and to teachers of singing and voice production. There is a message in the book to men and women of almost every calling, and everyone will find the text to be a model of writing and of how to convey information in a manner which commends itself to a teacher.

Scientific writings are, as a rule, mere catalogues of facts, put together in a manner more or less irrelevant. There is no reason for this except the absence of literary ability, a factor which obtains all too widely in medical and scientific writings generally. Huxley's works on scientific subjects, Sir Thomas Watson's on medicine, and Druitt's on surgery are exceptions to the rule, but they belong to a past generation, and seem to have left behind them no writers of their literary capacities. Dr. Hill, however, appears to have caught something of their inspiration, and we can only hope that he will deal with other subjects within his ken in a manner similar to that which he has given us in "The Body at Work."

OUR BOOK SHELF.

British and American Customary and Metric Legal Measures for Commercial and Technical Purposes. (Forming the Measure Section of Part i. of "The Mechanical Engineer's Reference Book.") By N. Foley. Pp. 25. (London: Crosby Lockwood and Son.) Price 7s. 6d. net.

THE necessity for these tables reminds us what an immense amount of time is wasted by the retention of the barbarous and cumbersome English system of measures. In two nations with more than 100 million people, not a small proportion of the school-time of every child is wasted in learning, and those engaged in industry and commerce in using, a system of measures which could not be less adapted to rapid and easy calculation. Yet we seem little nearer the time when our measures will be decimal and efficient, even though most of the opposition to the decimal system merits no respect.

The tables before us are for commercial and industrial use. All ordinary lengths, areas, volumes, weights, &c., in English measure can be converted, with their aid, at a minimum of calculation, to the metric equivalent. The range and arrangement of the equivalents have been thoughtfully chosen, and the printing is excellent, so the book lends itself to rapid use, and fits its purpose admirably.

We have only noted two serious misprints ("Tonne 2 = 1 ton, 1 qr., 9 lb." and the equivalent of 3 tonnes); there is also an unimportant slip in the equivalent of

15 c.c. in cubic inches on p. 10; in many other places where we have tested the tables they are correct. Page 6 is reprinted on p. 7, and p. 10 on p. 11 with only the decimal point moved, which seems a waste of space.

In defining the ohm, volt, and ampere, the last is confused with $1/10$ of the electromagnetic C.G.S. unit of current, while each of the former is "defined" in terms of the other and the ampere. The correct definitions, however, are mentioned by the author, but not as such. It would prevent confusion if the larger unit of heat were called in these tables a "kg.-calorie" instead of merely a "calorie."

It increases considerably the simplicity of the metric system if C.G.S. units are uniformly used in it. It is hoped that the author will help, as he well can, to attain this end by giving wherever possible in future editions of these conversion factors, the C.G.S. equivalent as the metric equivalent.

The units of pressure used in these tables are the engineer's lb. per square inch or kg. per square cm. Though they are thoroughly bad units, as they vary in magnitude from place to place and lead to confusion, they have, however, the advantage of conciseness over the physicist's "760 mm. of mercury at 0° C. in latitude 45° C. and at sea-level." The megadyne per sq. cm., which is nearly the average barometric pressure, deserves to be more generally used.

T. H. L.

- (1) *Leitfaden der Tierkunde für höhere Lehranstalten.* By K. Smalian. Erster Teil, pp. iv+40, price 1.20 marks; Zweiter Teil, pp. iii+41-100, price 1.50 marks; Dritter Teil, pp. 101-208, price 2 marks. (Leipzig: G. Freytag; Vienna: F. Tempsky, 1908.)
- (2) *Bau und Geschichte der Erde.* By O. Abel. Pp. viii+220. (Same publishers, 1909.) Price 4.50 marks.

(1) IN response, we are told, to a widely expressed wish, the author of the first of these works decided to condense and simplify his "Grundzuge der Tierkunde" (reviewed on a previous occasion in NATURE) so as to make a text-book. The result is the "Leitfaden," which is issued in three separate fasciculi, respectively suited (beginning with the last) to the requirements of the fourth, fifth, and six forms. The general plan of the work is to take a series of typical animals, and to make them texts for dissertations on the groups they represent. Despite the fact that some of the text-figures are of a somewhat ancient and obsolete type, the work seems well adapted for its purpose.

We cannot, however, congratulate the author on the coloured plates. In the first part, for instance, we see a fox crawling over a slab of blue limestone or slate on which its red coat stands out so conspicuously that the presence of the marauder would be at once detected. In the third part the plate of African animals wherein Grant's bonte-quagga (*Equus burchelli granti*) does duty for the zebra (*E. zebra*) reappears in spite of attention having been directed to the error in our notice of the "Grundzuge."

(2) The appearance of the second of the two works is due to a reform which has been made in science-teaching in the middle schools of Austria. To put such reform in action, a suitable and up-to-date text-book was, of course, a *sine quâ non*; and Dr. Abel was accordingly entrusted with the compilation of such a work. No better man could have been chosen, as is demonstrated by the volume before us, which is practically all that such a text-book should be. It is not overlaid with detail, each of the different sections of the subject receives its proper amount of space, and the illustrations, if not in the highest style, are at all events numerous. The volume commences

with a short account of the universe generally; this is followed by a short *précis* of dynamical geology, and the rest is devoted to stratigraphy and palæontology. A map of the geology of the Vienna basin directs the attention of the scholar to the importance of studying the strata of his own neighbourhood.

Goethe und Pestalozzi. By Karl Muthesius. Pp. vii +275. (Leipzig: Durr'schen Buchhandlung, 1908.) Price 4.50 marks.

WHEN all Europe was keenly excited by the social and educational work of a schoolmaster in a Swiss country town, Goethe held aloof. Pestalozzi's biographers have not hesitated to ascribe this to want of sympathy with the common people. Goethe, Minister of State and intellectual aristocrat, despised the poor and ignorant, and the *Schwärmerei* of early-nineteenth-century philanthropy seemed to him exaggerated, if not foolish. Such, at least, is a commonly received account of the matter, and the author of this interesting little book has shown what a libel upon the great man's memory it is. There can be little doubt, however, that Goethe made no effort to cultivate Pestalozzi, and still less that he distrusted Pestalozzian educational doctrine as it came under his notice. It was his misfortune to be acquainted with its weakest points. Goethe had no patience with an educational system which left out of its purview literature and history—everything, in fact, which could not be reduced to an A B C. In his view, geometry and geography, nature-study and language could never be made to fill up this gap, no matter how carefully they were systematised and ordered for school use.

Even the religious instruction of the traditional primary school was dropped by many of the new schoolmasters who had brought their inspiration from the shores of Lake Neuchâtel. The tendency was to give up everything that would not fall into the Pestalozzian plan of beginning with concrete examples and ending with a definition. This was poison to Goethe. It had all the vices of current naturalism. Everything great that men had done and thought might remain unknown. The school youth was not brought into touch with types of human greatness—moral, poetic, or artistic. He was taken out of his historical connections and set afresh in an environment of things that could be defined! Small wonder the poet was distrustful. We have learned to know Pestalozzi better than Goethe did.

La France et ses Colonies au Début du XX^e Siècle. By M. Fallex and A. Mairey. Pp. vi+660. (Paris: Ch. Delagrave, n.d.) Price 5 francs.

THIS is one volume of an excellent series of regional studies "at the beginning of the twentieth century," throughout which M. M. Fallex's has been the principal hand. We find here a proper conception of geographical study thoroughly well applied. In the first part of the work a general survey of France is provided—its position, area, configuration, structure, climate, hydrography, and population. In the second and most important part the country is divided into natural regions, each one of which is considered in succession on the same lines as those of the general survey. The division itself is worthy of commendation and notice—(i.) the Central *Massif*, subdivided between the east and centre and the west and south, (ii.) the Pyrenean region, (iii.) the basin of Aquitaine, (iv.) the Alps of Savoy, (v.) the Alps of Dauphiné and Haute-Provence, (vi.) the Jura, (vii.) the Saône-Rhône valley, (viii.) the Midi, (ix.) the north-east, (x.) the north, (xi.) the basin of Paris in three subdivisions, (xii.) Brittany. Next follows political and economic

geography, worked out no less satisfactorily than the regional. France itself occupies nearly five-sixths of the volume; the colonies, therefore, come in for what is perhaps disproportionately scanty treatment.

It is of no little interest to gather the French point of view as to the prospects of some of the colonies, for the authors are not content merely to make statements of fact and leave their readers to make inferences; here the inferences are found ready drawn, even if they are unflattering. Of the French establishments in Oceania we read "... ils ont toujours végété. C'est qu'ils sont trop loin de la France; en France on les connaît à peine." If this is so, the French student has an excellent opportunity of repairing his ignorance from this book and of extending the knowledge he gets from it, for excellent bibliographies are provided. There is also a full topographical index, a feature worthy of remark in a French work of this type. The illustrations are numerous and good.

The Interpretation of Radium. Being the Substance of Six Free Popular Lectures delivered at the University of Glasgow. By Frederick Soddy. Pp. xviii+256. (London: John Murray, 1909.) Price 6s net.

THIS book is based on popular experimental lectures delivered by Mr. Soddy at the University of Glasgow last year. The lecture form of address is retained, most of the experiments described being illustrated by photographs and diagrams. The book is intended chiefly for the lay reader, the author's object being rather to show the bearing of the new discoveries on our general outlook on nature than to give a detailed treatment of the subject.

The author gives a very clear and interesting account (in non-technical language) of radio-active phenomena and the light which the disintegration theory throws on them. The important work which Mr. Soddy has done in helping to establish this theory is a guarantee of the accuracy of his treatment. He confines his account mainly to the uranium-radium disintegration series.

The book will be found quite up-to-date, containing as it does reference to such recent work as Rutherford's proof that the α particle is an atom of helium, the experiments by Rutherford and Geiger in counting the number of α particles expelled by radium, and the author's own experiments on the production of helium from uranium and thorium. Many members of the general public, and workers in various departments of science, will find the book rich in interest.

Flower and Grass Calendars for Children. By Agnes Fry. Pp. 31. (Clifton: J. Baker and Son; London: Simpkin, Marshall and Co., Ltd., n.d.) Price 3d. net.

THE idea of making use of children's ability for committing verse to memory to introduce a few facts regarding the time of flowering and habits of plants, and thereby to stimulate their interest in botany, is commendable. The stanzas are short, and each is prefaced by a heading. There are four objects to be sought in such a calendar—the first to get true measure and cadence, the second to give good rhyme, the third to choose the correct month of flowering, and the fourth to introduce any striking facts regarding the character or habitats of the plants. The weakness of Miss Fry's verses lies chiefly in the measure, which is apt to be halt or forced; in this respect the grass calendar is more pleasing. As pointed out, the stanzas may and should be altered to suit the flowers in different localities.